REMARKS

Claims 15-27 are pending. By this Preliminary Amendment, the specification and drawings are amended and claims 1-14 are cancelled and new claims 15-27 are added. Prompt and favorable examination on the merits is respectfully requested.

The attached Appendix includes marked-up copies of each rewritten paragraph (37 C.F.R. §1.121(b)(1)(iii)).

Respectfully submitted,

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Attachments:
Appendix
Request for Approval of Drawing Corrections

Date: February 11, 2003

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APPENDIX

Changes to Specification:

Page 4, lines 10-15:

Briefly stated, a method in accordance with the invention and a communication system based thereon for conveying simultaneously both voice and data signals via a common twisted pair line includes a ~~splinterless~~ splitterless ADSL having incorporated therein a discrete multi-tone (DMT) unit. The DMT unit yields a plurality of carriers some of which are assigned to and modulated by digitized voice signals, others being assigned to and being modulated by digital data signals.

Page 4, line 28:

Fig. 1 is a block diagram of a prior art ADSL system of the ~~splinterless~~ splitterless type;

Page 6, lines 2-4:

Prior Art: An ADSL system for carrying out a communication method in accordance with the invention is of the ~~splinterless~~ splitterless type, thereby making it possible to convey both voice and data signals over a single twisted pair telephone cable.

Page 6, lines 5-8:

~~Inasmuch~~ In as much as the present system is an improvement over a prior art ADSL system of the ~~splinterles~~ splitterless type and uses many of the same components, the present system and its advantages over an existing system can best be understood by first considering the prior art system illustrated in Figs. 1, 2 and 3.

Page 8, lines 3-8:

The Invention: In a method in accordance with the invention and in a ~~slinterless~~ splitterless ADSL system for carrying out this method to convey voice and data signals simultaneously over a single twisted pair telephone cable, the disadvantages of prior art systems are overcome, particularly in regard to voice transmission. Instead of a single voice channel, an

ADSL system in accordance with the invention has incorporated therein several high-quality telephone channels.

Page 8, lines 9-15:

~~Them~~ The multi-tone modulation technique included in a system in accordance with the invention acts to separate the available bandwidth into a multiplicity of distinct carriers, each functioning as a communication channel. This makes it possible to convey voice and digital data signals simultaneously on different channels. In practice the DMT-ADSL ~~splinterless~~ splitterless system for short distances such as 9000 feet can support up to 8 telephone channels upstream with a bit rate of up to 250 Kb/s, and downstream with a bit rate of up to 6 Mb/s.

Page 8, lines 21-29:

Two upstream carriers and two downstream carriers are utilized for one voice channel which are hereinafter called "voice carriers" (VCs). The VCs are not predetermined before the onset of communication. During an initialization process, ~~in~~ the ADSL system measures the (SNR) signal-to-noise ratio for each carrier and defines the number of bits that may be loaded on respective carriers. Two downstream and two upstream carriers having the highest SNR which are capable of carrying more than 8-bits are then assigned for voice transmission. The selected carriers can carry more than 8 bits for each symbol. Nevertheless, they are only loaded with 8 bit symbols, as can be seen in black shading in the graph.

Page 11, lines 3-10:

Data Processing: Fig. 8A is a flow chart of the data processing steps implemented in an ATU transmitter (ADSL Transceiver Unit) according to the present invention. Data 153 is processed in step 151 by an interface port resulting in a sequence of ATM (Asynchronous Transfer Mode) cells. In step 155 these cells are scrambled and RS encoded. In step 157, an interleaver mixes data ~~its~~ bits to protect the encoded blocks of data from impulse noise. In step

263 tone ordering is calculated for the interleaved encoded data and the data is distributed to ~~126~~ 128 tones or carriers of the multitone line signal.

Page 14, lines 26-29 and Page 15, lines 1-2:

Incorporating several digital voice ~~channel~~ channels of the CO: An ATU-C transmitter in accordance with the invention is well adapted to ~~incorporating~~ incorporate electronic communication equipment of the CO, such as a PCM telephone switch (frame relay) having an ANSI T1 interface. According to a preferred embodiment of the invention, several streams of PCM telephone words of the CO are readily processed and communicated through the ADSL system.

Page 15, lines 3-13:

Data is processed in the same way as in the first example. Fig. 12 illustrates schematically the incorporation of a T1 format data stream containing several digital telephone channels into the ADSL system. First, the data stream 271 coming from a frame relay in T1 format is split into several channels by a T1 interface 277. Each such channel carries a sequence of 8 bit PCM words at a bit rate of 64 kb/s of a respective telephone channel. In the next step, each PCM stream 279 A, B,... is modulated by VCs DMT modulator 259~~,~~ that distributes each 64 kb/sec PCM stream between two VCs of DMT signal. In the next step, ~~A~~ a VCs QAM modulator and gain-scaler 261 transforms each 8-bit PCM word ~~in~~ into one 8-bit QAM symbol and provides a fixed ~~80-bit~~ 8-bit loading on each one of the VCs. A synchronization block 255 synchronizes the T1 system clock with the frames of the DMT line signal.

Page 15, lines 14-22:

Incorporation of several voice channels at a subscriber ~~premise~~ premises: Data is processed and transmitted in an ATU-R in the same way as described in the first example ~~1~~. Referring now to Fig. 13, it will be seen that voice channel 251A is connected to a voice interface port 253A which is one of several identical ports, where the necessary amplifying and

filtering is performed. A PCM encoder 257A is connected to the respective voice interface ports 253A. Each PCM ~~on~~ of the encoders has a sampling rate of 8 kHz and transforms an analog voice signal into a 64-kbit/sec sequence of 8-bit PCM words. The PCM coders use standard A-Law or μ-Law coding, which is the same one used in PCM telephone systems T1 or E1.

Page 15, lines 29-30 and Page 16, lines 1-2:

While there has been described and illustrated methods for simultaneously conveying both data and voice ~~sequels~~ signals over a twisted pair telephone line and various systems for carrying out these methods, it must be understood that many changes may be made thereon without departing from the spirit of the claims.

Changes to Claims:

Claims 1-14 are canceled.

Claims 15-27 are added.

Changes to the Drawings:

Figure 10A, step 155,

~~SCRAMLING~~ SCRAMBLING